

WHAT IS CLAIMED IS:

1. A disk array apparatus comprising:

a plurality of storage devices by which writing or reading data is executed in such a way that, when there is
5 caused an error in writing or reading data into or from a storage area, writing or reading data is repeated again after notifying that writing or reading data has been normally completed;

storage device control sections which includes storing
10 areas saving requests for write or read operations of data into or from said plurality of storage devices, controls the write or read operation of data into or from said plurality of storage devices, and receives notification that the write or read operation of data into or from said plurality of storage
15 devices is normally completed;

channel sections which receives a request for write or read operation from a network outside the disk array apparatus itself;

a shared memory in which pieces of control information
20 communicated by said channel control sections and said storage device control sections are stored;

a cache memory in which pieces of data for communication between said channel control sections and said storage device control section are temporarily saved; and

25 a connecting section connected to said channel control sections, said storage device control sections, said shared memory, and said cache memory, wherein:

said storage device control sections generate logical

storage areas using said storage areas in said plurality of storage devices, said logical storage areas being used for writing or reading data and having redundancy to store data;

5 said storage device control sections monitor said storing areas in which a request for writing or reading data into or from the plurality of storage devices forming the logical storage areas is stored; and

10 among said plurality of storage devices forming said logical storage areas, said storage device control sections specify a storage device, for which a number of repeated times is large, and block said specified storage device.

2. The disk array apparatus according to claim 1, wherein said plurality of storage devices have redundancy;

15 said shared memory comprises areas in which write pending data sizes to be written into said storage device in said cache memory are held; and

20 said storage device control sections compare said write pending data sizes among said plurality of storage devices with the redundancy when said storage device with a larger number of repeated times for writing or reading data is specified, and specify the storage device with larger write pending data size as one to be blocked.

25 3. The disk array apparatus according to claim 1, wherein said plurality of storage devices have redundancy; said shared memory has areas which hold average response

times for each of the plurality of storage devices; and

said storage device control sections compare said average response times among said plurality of storage devices with the redundancy when the storage device with a larger number of repeated times for writing or reading data is specified, and specify the storage device with larger average response time as one to be blocked.

4. The disk array apparatus according to claim 1, wherein

said plurality of storage devices have redundancy; and

said storage device control sections have areas which hold queue numbers for each of the plurality of storage devices, compare said queue numbers among said plurality of storage devices with the redundancy when the storage device with a larger number of repeated times for writing or reading data is specified, and specify the storage device with larger average response time as one to be blocked.

5. The disk array apparatus according to claim 1, wherein

said plurality of storage devices has redundancy; and

said storage device control sections specify the storage device with a larger number of repeated times at writing or reading data and block the storage device, and, subsequently, restore pieces of data in a backup storage device, using the pieces of data in other storage devices with redundancy.

6. The disk array apparatus according to claim 1, wherein

said plurality of storage devices have redundancy;

said disk array apparatus further comprise a management terminal connected to the connection section; and

said management terminal sets conditions for specifying,
5 among said storage devices with the redundancy, the storage device with a larger number of repeated times for writing or reading data.

7. The disk array apparatus according to claim 6, wherein
10 one of the conditions is the number of repeated times for writing or reading data.

8. The disk array apparatus according to claim 6, wherein
one of the conditions is a differential multiple of an
15 amount of a piece of write pending data in the cache memory to be written into said storage devices.

9. The disk array apparatus according to claim 6, wherein
one of the conditions is a differential multiple of an
20 average response time for each of said plurality of storage devices.

10. The disk array apparatus according to claim 6, wherein
one of the conditions is a differential multiple of a
25 queue number for each of said plurality of storage devices.

11. A method for controlling a disk array apparatus, said

apparatus comprising:

a plurality of storage devices by which writing or reading data is executed in such a way that, when there is caused an error in writing or reading data into or from a storage area, writing or reading data is repeated again after notifying that writing or reading data has been normally completed;

storage device control sections which includes storing areas storing requests for write or read operations of data into or from said plurality of storage devices, controls the write or read operation of data into or from said plurality of storage devices, and receives notification that the write or read operation of data into or from said plurality of storage devices is normally completed;

channel sections which receives a request for write or read operation from a network outside the disk array apparatus itself;

a shared memory in which pieces of control information communicated by said channel control sections and said storage device control sections are stored;

a cache memory in which pieces of data for communication between said channel control sections and said storage device control section are temporarily stored; and

a connecting section connected to said channel control sections, said storage device control sections, said shared memory, and said cache memory, wherein:

said storage device control sections generate logical

storage areas using said storage areas in said plurality of storage devices, said logical storage areas being used for writing or reading data and having redundancy to store data,;

said storage device control sections monitor said storing
5 areas in which a request for writing or reading data into or from the plurality of storage devices forming the logical storage areas is stored; and

among the plurality of storage devices forming the logical storage areas, said storage device control sections
10 specify a storage device, for which a number of repeated times is large, and block said specified storage device.

12. The method for controlling a disk array apparatus according to claim 11, wherein

15 said plurality of storage devices have redundancy;
said shared memory comprises areas in which write pending data sizes to be written into said storage device in said cache memory are held; and

said storage device control sections compare said write
20 pending data sizes among said plurality of storage devices with the redundancy when said storage device with a larger number of repeated times for writing or reading data is specified, and specify the storage device with larger write pending data size as one to be blocked.

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13. The method for controlling a disk array apparatus according to claim 11, wherein

said plurality of storage devices have redundancy;

said shared memory has areas which hold average response times for each of the plurality of storage devices; and

said storage device control sections compare said average
5 response times among said plurality of storage devices with the redundancy when the storage device with a larger number of repeated times for writing or reading data is specified, and specify the storage device with larger average response time as one to be blocked.

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14. The method for controlling a disk array apparatus according to claim 11, wherein

said plurality of storage devices have redundancy; and

said storage device control sections have areas which
15 hold queue numbers for each of the plurality of storage devices, compare said queue numbers among said plurality of storage devices with the redundancy when the storage device with a larger number of repeated times for writing or reading data is specified, and specify the storage device with larger average
20 response time as one to be blocked.

15. The method for controlling a disk array apparatus according to claim 11, wherein

said plurality of storage devices has redundancy; and

said storage device control sections specify the storage
25 device with a larger number of repeated times at writing or reading data and block the storage device, and, subsequently,

restore pieces of data in a backup storage device, using the pieces of data in other storage devices with redundancy.

16. The method for controlling a disk array apparatus
5 according to claim 11, wherein

said plurality of storage devices have redundancy;

said disk array apparatus further comprise a management terminal connected to said connecting section; and

said management terminal sets conditions for specifying,
10 among the storage devices with the redundancy, the storage device with a larger number of repeated times for writing or reading data.

17. The method for controlling a disk array apparatus
15 according to claim 16, wherein

one of the conditions is the number of repeated times for writing or reading data.

18. The method for controlling a disk array apparatus
20 according to claim 16, wherein

one of the conditions is a differential multiple of an amount of a piece of write pending data in the cache memory to be written into said storage devices.

25 19. The method for controlling a disk array apparatus according to claim 16, wherein

one of the conditions is a differential multiple of an

average response time for each of said plurality of storage devices.

20. The method for controlling a disk array apparatus
5 according to claim 16, wherein
one of the conditions is a differential multiple of a
queue number for each of said plurality of storage devices.